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10/529,758

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EXAMINER

TOLIN, MICHAEL A

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/529,758	Applicant(s) HIRATA ET AL.	
	Examiner MICHAEL A. TOLIN	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 17-29 is/are pending in the application.
- 4a) Of the above claim(s) 20-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 17-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6, 8-14, and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kimura (US 3639953) and optionally further in view of Masaru (JP 2001-073226, referencing attached machine translation) as evidence of inherency.

Kimura teaches a process for manufacturing carbon fiber comprising the steps of melt spinning a mixture of pitch and thermoplastic resin within the claimed weight ranges (Abstract; column 1, lines 64-75; column 2, lines 1-44), subjecting to a stabilization treatment in air, which satisfies the claimed gas containing oxygen (column 3, lines 14-30; column 4, lines 71-75; column 5, lines 1-15), and carbonizing or graphitizing to form a carbon fiber (column 5, lines 16-34). As noted in the previous office action, spinning to form a composite fiber satisfies the claimed limitation of “spinning or forming a mixture” because there is no requirement in claim 1 of kneading the thermoplastic carbon precursor and the thermoplastic resin to form a mixture and subsequently melt spinning the mixture. As to the claimed step of removing, Kimura is directed to forming a carbon fiber. Accordingly, one of ordinary skill in the art would

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have readily appreciated that the thermoplastic component is inherently removed at some point in the process, thus satisfying the claimed removing limitation. Furthermore, the process of Kimura is substantially the same as that disclosed by Applicant, wherein removal of the thermoplastic component may occur by thermal decomposition under conditions similar to those provided by Kimura (see Applicant's specification, page 18, lines 1-14; see Kimura, column 5, lines 4-34). Masaru is optionally cited as evidence that such high temperature treatment will inherently remove the polyethylene component suggested by Kimura (see Kimura, column 2, lines 2-3). Masaru explains that polyethylene is removed by pyrolysis in the carbonization of a precursor carbon fiber comprising a composite of polyethylene and carbon precursor material (paragraphs 20-23).

Regarding claims 2-4 and 6, Kimura teaches polyethylene (column 2, lines 2-3). It is clear from Applicant's specification that polyethylene satisfies the limitations of claims 2-4 and 6 (Applicant's specification; page 6, lines 16-34; page 7, lines 1-31; page 8, lines 1-9).

Regarding claims 8-11, all of these claims are satisfied by providing an additional 0.001 to 20 parts by weight of polyethylene. The claims do not require that the copolymer is used. All of the claims are generic to using the copolymer (E) or the homopolymer (F). Additionally, the specification indicates that the homopolymer may be polyethylene (Applicant's specification, page 13). This would slightly raise the weight percent of the polyethylene in the mixture, but to a level still suggested by Kimura

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(column 2, lines 21-40). There is no requirement in the claims that the claimed additional polymer is different from the thermoplastic resin.

The limitation of claim 12 is satisfied for the reasons provided above.

Regarding claim 13, Kimura extrudes at temperatures within the claimed range (see Examples).

Regarding claim 14, modification of the film formation alternative in generic claim 1 does not require formation of a film since claim 1 is generic to forming a fiber or film. Accordingly, this claim is satisfied for the reasons provided above.

Regarding claim 17, Kimura clearly indicates stretching immediately after spinning (i.e. extrusion of the fiber through a nozzle) and prior to stabilization (column 2, lines 45-55).

Kimura clearly teaches the limitations of claims 18 and 19 (column 5, lines 4-33).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 6, 8-14 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura in view of Masaru.

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Since Kimura does not explicitly recite removal of the thermoplastic component, the teachings of Masaru noted above (paragraphs 20-23) are applied here to provide motivation to perform the claimed step of removal. Masaru suggests removal of the thermoplastic component in the carbonization process in order to suitably obtain the desired carbon fibers in a manner which does not require the use of solvents to remove the thermoplastic component. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the claimed removal by pyrolysis because one of ordinary skill in the art would have been motivated to suitably obtain the desired carbon fibers without using solvents to remove the thermoplastic component in accordance with the teachings of Masaru.

5. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura and optionally further in view of Masaru.

The above rejection of claims 1-4, 6, 8-14, and 17-19 under 35 USC 102 is incorporated herein. The above rejection of claims 1-4, 6, 8-14, and 17-19 under 35 USC 103 is also incorporated herein. Masaru is alternatively applied as evidence of inherency as in the 102 rejection, or for providing motivation for providing the claimed removing limitation as in the 103 rejection.

Regarding claim 7 and 15, precursor fiber dimensions within the ranges provided in these claims are generally conventional in the art of melt spinning pitch to form carbon fibers. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide precursor fiber dimensions within these claimed ranges

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because one of ordinary skill in the art would have been motivated to form suitable carbon fibers in accordance with conventional methods in the art.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura and optionally further in view of Masaru as applied to claims of 7 and 15 above, and further in view of Lewis (US 3995014).

As to the use of mesophase pitch, such is well known in the art as a desirable pitch composition for producing carbon fibers having high tensile strength. Lewis is cited as evidence for this assertion (column 2, lines 41-58; column 4, lines 45-48; column 12, lines 46-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the claimed mesophase pitch as the carbon precursor because one of ordinary skill in the art would have been motivated to produce high tensile strength carbon fibers in accordance with well known methods as evidenced by Lewis.

7. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura and optionally further in view of Masaru as applied to claims of 7 and 15 above, and further in view of Powell (US 3852428).

Powell is applied as in numbered paragraph 9 of the previous office action mailed 22 October 2008. It is also noted that Powel clearly suggests providing the copolymer additive at a concentration within the claimed range (column 2, lines 34-67).

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8. Claims 1-4, 6-15 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaru in view of Kimura.

The claims are rejected here in the alternative in the event that the claims are interpreted to require a step of mixing the thermoplastic resin and the thermoplastic carbon precursor prior to spinning.

Masaru teaches a method of forming ultrafine carbon fibers by kneading a mixture of phenol carbon precursor resin with thermoplastic polyethylene at weight concentrations within the claimed range, melt spinning the resulting mixture, carbonizing at high temperature and removing the polyethylene component by pyrolysis during carbonization (Abstract; paragraphs 7, 11, 12, 14, 15, 18-23). Masaru differs from the claims in that Masaru does not teach one of the claimed particular carbon precursor materials and Masaru does not teach the claimed stabilization treatment.

While Masaru suggests phenol as the carbon precursor, it is generally well known that pitch is an alternative carbon precursor having particular advantages such as excellent yield in the step of carbonization and a relatively fast carbonization step (see Kimura, column 1, lines 22-30). As noted in the rejection of claims 1-4, 6, 12-14, and 17-19 above, Kimura also teaches the claimed stabilization step for suitable production of carbon fibers when using pitch as the precursor material. It would have been obvious to one of ordinary skill in the art at the time of the invention to use pitch and the claimed stabilization treatment in a modified process of Masaru because one of ordinary skill in the art would have been motivated to use alternative carbon precursor materials or because one of ordinary skill in the art would have been motivated to

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achieve the above noted benefits of pitch precursor material in accordance with the teachings of Kimura. As to reasonable expectation of success, like Masaru, Kimura is directed to the formation of composite carbon precursor/polyolefin fibers which are subsequently treated at high temperature to form carbon fibers. Accordingly, there would have been a reasonable expectation of success in modifying the process of Masaru to use pitch as the carbon precursor material. As to the claimed weight ranges, such as clearly taught by Kimura as noted above in the rejection of claims 1-4, 6, 12-14, and 17-19.

The limitations of claims 2-4, 6-14 and 17-19 are satisfied for the reasons provided above in the rejection of claims 1-4, 6, 8-14, and 17-19 and the rejection of claims 7 and 15.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masaru in view of Kimura as applied to claims 1-4, 6-15 and 17-19 above, and further in view of Lewis.

Lewis is applied as above in the rejection of claim 5.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140

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F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-4, 6, 8-11 and 14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 45 of copending Application No. 10/578,776. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 45 of the '776 Application, while narrower than claims 1-6 in requiring a melt blow method (a type of spinning), provides each of the currently claimed spinning, stabilization, removing, and carbonizing limitations.

Regarding claims 8-11, all of these claims are satisfied by providing an additional 0.001 to 20 parts by weight of polyethylene. The claims do not require that the copolymer is used. All of the claims are generic to using the copolymer (E) or the homopolymer (F). Additionally, the specification indicates that the homopolymer may be polyethylene (Applicant's specification, page 13). This would slightly raise the weight percent of the polyethylene in the mixture, but to a level still suggested by claim 45 of the '775 application since the claimed range of carbon precursor is so large (column 2, lines 21-40).

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Regarding claim 14, this claim modifies one of the alternatives, i.e. film formation, and thus does not preclude formation of fibers.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claim 15 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 39 of copending Application No. 10/578,776. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 39 of the '776 Application clearly provides the additional limitation of current claim 15.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claim 5 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 42 of copending Application No. 10/578,776. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 42 of the '776 Application clearly provides the additional limitation of current claim 5.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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5. Claims 7, 12, 13 and 17-19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 37 of copending Application No. 10/578,776 in view of Kimura and optionally further in view of Masaru.

Kimura and Masaru are applied as above in numbered paragraphs 2, 4 and 5 for suggesting the limitations of claims 7, 12, 13 and 17-19.

This is a provisional obviousness-type double patenting rejection.

Withdrawal of Previously Indicated Allowable Subject Matter

6. Upon further consideration of claims 8-11, it is noted that there is no requirement that the homopolymer (F) is different than the thermoplastic resin. The specification indicates that homopolymer (F) can be polyethylene (page 13). As noted in the rejections above, an additional amount of polyethylene in the range indicated by claim 8 is still suggested by the ranges taught by Kimura or Masaru. The subject matter specified on page 12 of the previous office action as being allowable is no longer considered allowable. This previous indication of allowable subject matter is withdrawn. Since Applicant did not previously claim this subject matter, as page 12 of the previous office action required an additional limitation directed to mixing prior to spinning, and Applicant has not presented new claims to this previously indicated subject matter, it is considered proper to make this action FINAL in view of the amendments to claim 1.

Response to Arguments

7. Applicant's arguments filed 22 January 2009 have been fully considered but they are not persuasive.

Applicant indicated that the examiner considers claims 8-11 to be allowable if rewritten in independent form. The examiner respectfully disagrees with this statement. As stated on page 12 of the previous office action, claims 8-11 were indicated allowable if rewritten in independent form and further amended to clearly indicate that the mixture of the thermoplastic carbon precursor, thermoplastic resin and additional polymer is first provided and then subsequently spun into a precursor fiber. However, as noted above, this previous indication of allowable subject matter has been withdrawn.

Applicant has not provided any arguments against the double patenting rejections. Accordingly, these rejections have been maintained, although the grounds have been changed as necessitated by the amendment.

Applicant's arguments regarding the rejection under 35 USC 112, second paragraph, were persuasive. This rejection has been withdrawn.

Applicant argues Masaru is directed to a wet stabilization process as opposed to stabilization in the claimed gas. In response, Masaru was not relied upon for a particular stabilization treatment. Kimura establishes that the claimed stabilization process is well known for manufacturing carbon fibers from pitch. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's argument with respect to Powell is not understood. The claims do not provide 100% by weight thermoplastic resin. The claims provide 100 parts by weight thermoplastic resin for every 1 to 150 parts by weight of carbon precursor. Moreover, Powell was not applied against the thermoplastic resin. Powell was applied against the additional polymer of claims 8-11.

Applicant's remaining arguments against rejections using Dugan and Kiyohide are moot in view of the new grounds of rejection in which these references have not been applied. The new grounds of rejection were necessitated by Applicant's amendment to claim 1.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). The new grounds of rejection were necessitated by Applicant's amendment to claim 1 removing polyacrylonitrile from the group of carbon precursor materials and modifying the stabilization treatment limitation.

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL A. TOLIN whose telephone number is (571)272-8633. The examiner can normally be reached on M-F 9am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael A Tolin/
Examiner, Art Unit 1791

/Richard Crispino/
Supervisory Patent Examiner, Art Unit 1791